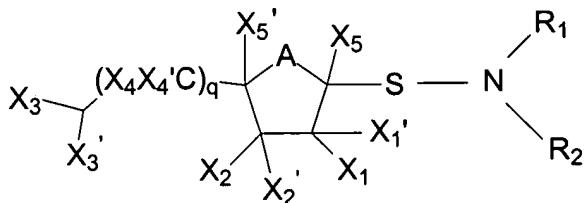


Claims:

1. A compound of general formula (I):



5

wherein A is selected from the group consisting of O, S, SO, SO<sub>2</sub>, Se, Te, NR<sub>8</sub>, CR<sub>9</sub>R'<sub>9</sub>, N → O and C(O);

and, when A is O and q is 1, one of R<sub>1</sub> and R<sub>2</sub> is selected from the group consisting of hydrogen, optionally substituted C<sub>1-3</sub> or >C<sub>30</sub> alkyl, alkyl when interrupted by one or more heteroatoms or functional groups selected from the group consisting of O, S, -N=, NR, and -(Y)<sub>m</sub>C=(Z)(T)<sub>n</sub>-, optionally substituted C<sub>2-3</sub> or >C<sub>30</sub> alkenyl, alkenyl when interrupted by one or more heteroatoms or functional groups selected from the group consisting of O, S, -N=, NR, and -(Y)<sub>m</sub>C=(Z)(T)<sub>n</sub>-, optionally substituted aralkyl which may be interrupted within the alkyl moiety by one or more heteroatoms or functional groups selected from the group consisting of O, S, -N=, NR, and -(Y)<sub>m</sub>C=(Z)(T)<sub>n</sub>-, 10 optionally substituted acyl, optionally substituted aryl, optionally substituted heterocyclic and a carbohydrate moiety, while the other of R<sub>1</sub> and R<sub>2</sub> is selected from the group consisting of hydrogen, optionally substituted alkyl which may be interrupted by one or more heteroatoms or 15 functional groups selected from the group consisting of O, S, -N=, NR, and -(Y)<sub>m</sub>C=(Z)(T)<sub>n</sub>-, optionally substituted alkenyl which may be interrupted by one or more heteroatoms or functional groups selected from the group consisting of O, S, -N=, NR, and -(Y)<sub>m</sub>C=(Z)(T)<sub>n</sub>-, 20 optionally substituted acyl, optionally substituted aryl, optionally substituted heterocyclic and a carbohydrate moiety, while the other of R<sub>1</sub> and R<sub>2</sub> is selected from the group consisting of hydrogen, optionally substituted alkyl which may be interrupted by one or more heteroatoms or 25 functional groups selected from the group consisting of O, S, -N=, NR, and -(Y)<sub>m</sub>C=(Z)(T)<sub>n</sub>-, optionally substituted alkenyl which may be interrupted by one or more heteroatoms or functional groups selected from the group consisting of O, S, -N=, NR, and -(Y)<sub>m</sub>C=(Z)(T)<sub>n</sub>-, 30 optionally substituted aralkyl which may be interrupted within the alkyl moiety by one or more heteroatoms or functional groups selected from the group consisting of O, S, -N=, NR, and -(Y)<sub>m</sub>C=(Z)(T)<sub>n</sub>-, optionally substituted

aryl, optionally substituted heterocyclic, optionally substituted acyl and a carbohydrate moiety;

but, when A is S, SO, SO<sub>2</sub>, Se, Te, NR<sub>8</sub>, CR<sub>9</sub>R<sub>9'</sub>, N → O or C(O) and q is 1 or A is O, S, SO, SO<sub>2</sub>, Se, Te, NR<sub>8</sub>, CR<sub>9</sub>R<sub>9'</sub>, N → O or C(O) and q is 0, then R<sub>1</sub> and R<sub>2</sub> are independently selected from the group consisting of hydrogen, optionally substituted alkyl which may be interrupted by one or more heteroatoms or functional groups selected from the group consisting of O, S, -N=, NR<sub>7</sub> and -(Y)<sub>m</sub>C=(Z)(T)<sub>n</sub>-, optionally substituted alkenyl which may be interrupted by one or more heteroatoms or functional groups selected from the group consisting of O, S, -N=, NR<sub>7</sub> and -(Y)<sub>m</sub>C=(Z)(T)<sub>n</sub>-, optionally substituted aralkyl which may be interrupted within the alkyl moiety by one or more heteroatoms or functional groups selected from the group consisting of O, S, -N=, NR<sub>7</sub> and -(Y)<sub>m</sub>C=(Z)(T)<sub>n</sub>-, optionally substituted aryl, optionally substituted acyl and a carbohydrate moiety, or R<sub>1</sub> and R<sub>2</sub> together with the nitrogen atom from which they depend form a saturated or unsaturated, optionally substituted heterocyclic group which may include additional heteroatoms selected from the group consisting of O, N and S;

X<sub>1</sub> is selected from the group consisting of OR<sub>3</sub>, SR<sub>3</sub>, NR<sub>3</sub>R'<sub>3</sub>, hydrogen, halogen, -(Y)<sub>m</sub>C=(Z)(T)<sub>n</sub>R<sub>3</sub>, -N(C=(Z)(T)<sub>n</sub>R<sub>3</sub>)<sub>2</sub>, N<sub>3</sub>, CN, OCN, SCN, OSO<sub>3</sub>R<sub>3</sub>, OSO<sub>2</sub>R<sub>3</sub>, OPO<sub>3</sub>R<sub>3</sub>R'<sub>3</sub>, OPO<sub>2</sub>R<sub>3</sub>R'<sub>3</sub>, S(O)R<sub>3</sub>, S(O)<sub>2</sub>R<sub>3</sub>, S(O)<sub>2</sub>OR<sub>3</sub>, PO<sub>3</sub>R<sub>3</sub>R'<sub>3</sub>, NR<sub>3</sub>NR'<sub>3</sub>R''<sub>3</sub>, SNR<sub>3</sub>R'<sub>3</sub>, NR<sub>3</sub>SR'<sub>3</sub>, SSR<sub>3</sub> and R<sub>3</sub>, or is an oxo group, =S, =NOR<sub>3</sub> or =CR<sub>3</sub>R'<sub>3</sub> and X<sub>1</sub>' is absent;

X<sub>2</sub> is selected from the group consisting of OR<sub>4</sub>, SR<sub>4</sub>, NR<sub>4</sub>R'<sub>4</sub>, hydrogen, halogen, -(Y)<sub>m</sub>C=(Z)(T)<sub>n</sub>R<sub>4</sub>, -N(C=(Z)(T)<sub>n</sub>R<sub>4</sub>)<sub>2</sub>, N<sub>3</sub>, CN, OCN, SCN, OSO<sub>3</sub>R<sub>4</sub>, OSO<sub>2</sub>R<sub>4</sub>, OPO<sub>3</sub>R<sub>4</sub>R'<sub>4</sub>, OPO<sub>2</sub>R<sub>4</sub>R'<sub>4</sub>, S(O)R<sub>4</sub>, S(O)<sub>2</sub>R<sub>4</sub>, S(O)<sub>2</sub>OR<sub>4</sub>, PO<sub>3</sub>R<sub>4</sub>R'<sub>4</sub>, NR<sub>4</sub>NR'<sub>4</sub>R''<sub>4</sub>, SNR<sub>4</sub>R'<sub>4</sub>, NR<sub>4</sub>SR'<sub>4</sub>, SSR<sub>4</sub> and R<sub>4</sub>, or is an oxo group, =S, =NOR<sub>4</sub> or =CR<sub>4</sub>R'<sub>4</sub> and X<sub>2</sub>' is absent;

X<sub>3</sub> and X<sub>3</sub>' are independently selected from the group consisting of OR<sub>5</sub>, SR<sub>5</sub>, NR<sub>5</sub>R'<sub>5</sub>, hydrogen, halogen, -

$(Y)_m C = (Z) (T)_n R_5$ ,  $-N(C = (Z) (T)_n R_5)_2$ ,  $N_3$ ,  $CN$ ,  $OCN$ ,  $SCN$ ,  $OSO_3 R_5$ ,  $OSO_2 R_5$ ,  $OPO_3 R_5 R'_5$ ,  $OPO_2 R_5 R''_5$ ,  $S(O) R_5$ ,  $S(O)_2 R_5$ ,  $S(O)_2 OR_5$ ,  $PO_3 R_5 R'_5$ ,  $NR_5 NR'_5 R''_5$ ,  $SNR_5 R'_5$ ,  $NR_5 SR'_5$ ,  $SSR_5$  and  $R_5$ , or  $X_3$  is  $=O$ ,  $=S$ ,  $=NOR_5$  or  $=CR_5 R'_5$  and  $X_3'$  is absent;

5  $X_4$  is selected from the group consisting of  $OR_6$ ,  $SR_6$ ,  $NR_6 R'_6$ , hydrogen, halogen,  $-(Y)_m C = (Z) (T)_n R_6$ ,  $-N(C = (Z) (T)_n R_6)_2$ ,  $N_3$ ,  $CN$ ,  $OCN$ ,  $SCN$ ,  $OSO_3 R_6$ ,  $OSO_2 R_6$ ,  $OPO_3 R_6 R'_6$ ,  $OPO_2 R_6 R''_6$ ,  $S(O) R_6$ ,  $S(O)_2 R_6$ ,  $S(O)_2 OR_6$ ,  $PO_3 R_6 R'_6$ ,  $NR_6 NR'_6 R''_6$ ,  $SNR_6 R'_6$ ,  $NR_6 SR'_6$ ,  $SSR_6$  and  $R_6$ , or is an oxo group,  $=S$ ,  $=NOR_6$  or  $=CR_6 R'_6$  and  $X_4'$  is absent;

10  $X_5$  is selected from the group consisting of hydrogen,  $CN$ ,  $-C = (Z) (T)_n R_{11}$ ,  $S(O) R_{11}$ ,  $S(O)_2 R_{11}$ ,  $S(O)_2 OR_{11}$ ,  $PO_3 R_{11} R'_{11}$ , optionally substituted alkyl, optionally substituted alkaryl, optionally substituted aryl, 15 optionally substituted aralkyl, and optionally substituted acyl;

20  $X_1'$ ,  $X_2'$ ,  $X_4'$  and  $X_5'$  are the same or different and are selected from the group consisting of hydrogen,  $CN$ , optionally substituted alkyl, optionally substituted alkaryl, optionally substituted aryl, optionally substituted aralkyl, and optionally substituted acyl;

25 or one of  $X_1$  and  $X_2$ ,  $X_2$  and  $X_5'$ ,  $X_5'$  and  $A$  when  $A$  contains a carbon or nitrogen atom,  $X_5$  and  $A$  when  $A$  contains a carbon or nitrogen atom, and  $X_5$  and  $X_1$  together 30 constitute a double bond, or  $X_5'$  and  $X_4$  or  $X_3$  and  $X_4$  together constitute a double bond, or  $R_1$  and  $X_1$ ,  $R_2$  and  $X_1$ ,  $R_1$  and  $X_2$ ,  $R_2$  and  $X_2$ ,  $R_1$  and  $X_5$ ,  $R_2$  and  $X_5$ ,  $R_1$  and  $X_5'$ ,  $R_2$  and  $X_5'$ ,  $X_1$  and  $X_2$ ,  $X_2$  and  $X_3$ ,  $X_2$  and  $X_4$ ,  $X_3$  and  $X_4$ ,  $X_1$  and  $X_1'$ ,  $X_2$  and  $X_2'$ ,  $X_3$  and  $X_3'$  or  $X_4$  and  $X_4'$  together form part of a ring structure which optionally includes at least one heteroatom selected from  $O$ ,  $S$  and  $N$  and is optionally substituted;

35  $m$ ,  $n$  and  $q$  are independently 0 or 1 and  $Y$ ,  $Z$  and  $T$  are independently selected from the group consisting of  $O$ ,  $S$ , and  $NR_{10}$ ;

$R_3$ ,  $R'_3$ ,  $R''_3$ ,  $R_4$ ,  $R'_4$ ,  $R''_4$ ,  $R_5$ ,  $R'_5$ ,  $R''_5$ ,  $R_6$ ,  $R'_6$ ,  $R''_6$ ,  $R_7$ ,  $R_8$ ,  $R_9$ ,  $R'_9$ ,  $R_{10}$ ,  $R_{11}$  and  $R'_ {11}$  are the same or

different and are selected from the group consisting of hydrogen, optionally substituted alkyl, optionally substituted alkenyl, optionally substituted aryl, optionally substituted aralkyl, optionally substituted acyl and a carbohydrate moiety;

5 with the proviso that at least two of  $X_1$ ,  $X_2$ ,  $X_3$  and  $X_4$  are other than hydrogen or a group linked to the ring through a carbon-carbon bond and the further proviso that the compound of general formula (I) is not 1-(9H-purinyl)-S-(3-deoxy-pentafuranosyl)sulfenamide

10 5-formamido-2',3',5'-tri-O-formyl-1-( $\beta$ -D-ribofuranosylthio)imidazole-4-carboxamide, N-phenyl-S-(2,3:5,6-di-O-isopropylidene- $\beta$ -D-mannofuranosyl)sulfenamide or

15 N,N-diethyl-S-(2,3,5,6-tetra-O-benzoyl- $\beta$ -D-galactofuranosyl)sulfenamide;

or a pharmaceutically acceptable salt thereof.

2. A compound as claimed in claim 1 wherein q is 0 or q is 1 and A is selected from S, SO, SO<sub>2</sub>, Se, Te, NR<sub>8</sub>, CR<sub>9</sub>R'<sub>9</sub>, N → O or C(O) and one or both of R<sub>1</sub> and R<sub>2</sub> is alkyl.

20 3. A compound as claimed in claim 2 wherein one or both of R<sub>1</sub> and R<sub>2</sub> is C<sub>4-30</sub> alkyl.

4. A compound as claimed in claim 3 wherein one or 25 both of R<sub>1</sub> and R<sub>2</sub> is C<sub>6-12</sub> alkyl.

5. A compound as claimed in claim 4 wherein one or both of R<sub>1</sub> and R<sub>2</sub> is C<sub>8-10</sub> alkyl.

6. A compound as claimed in claim 1 wherein one or both of R<sub>1</sub> and R<sub>2</sub> is aralkyl.

30 7. A compound as claimed in claim 6 wherein one or both R<sub>1</sub> and R<sub>2</sub> is (CH<sub>2</sub>)<sub>r</sub>Ph where Ph is phenyl and r is an integer in the range 1 to 12 inclusive.

8. A compound as claimed in claim 1 wherein one or both of R<sub>1</sub> and R<sub>2</sub> is alkyl interrupted by one or more 35 heteroatoms or functional groups selected from the group consisting of O, S, -N=, NR<sub>7</sub>, and -(Y)<sub>m</sub>C=(Z)(T)<sub>n</sub>.

9. A compound as claimed in claim 8 wherein one or

both of  $R_1$  and  $R_2$  is alkyl interrupted by one or more oxygen atoms.

10. A compound as claimed in claim 9 wherein one or both of  $R_1$  and  $R_2$  is  $CH_3(CH_2)_xO(CH_2)_yO(CH_2)_z$  wherein  $x$  is an integer in the range 0 to 12 inclusive and  $y$  and  $z$  are independently integers in the range 1 to 12 inclusive.

11. A compound as claimed in claim 1 wherein  $q$  is 0 or  $q$  is 1 and  $A$  is selected from S, SO, SO<sub>2</sub>, Se, Te, NR<sub>8</sub>, CR<sub>9</sub>R'<sub>9</sub>, N → O or C(O) and one or both of  $R_1$  and  $R_2$  is 10 alkenyl.

12. A compound as claimed in claim 1 wherein  $R_1$  and  $R_2$  together with the nitrogen atom from which they depend form an optionally substituted saturated or unsaturated heterocyclic group.

15. 13. A compound as claimed in claim 12 wherein  $R_1$  and  $R_2$  together with the nitrogen atom from which they depend form a cyclic imide or a lactam.

14. A compound as claimed in any one of claims 1 to 13 wherein  $X_1$  is OR<sub>3</sub>.

20. 15. A compound as claimed in claim 14 wherein  $R_3$  is hydrogen or optionally substituted acyl.

16. A compound as claimed in any one of claims 1 to 15 wherein  $X_2$  is OR<sub>4</sub>.

25. 17. A compound as claimed in claim 16 wherein  $R_4$  is hydrogen or optionally substituted acyl.

18. A compound as claimed in any one of claims 1 to 17 wherein  $X_3$  is OR<sub>5</sub>.

19. A compound as claimed in claim 18 wherein  $R_5$  is hydrogen or optionally substituted acyl.

30. 20. A compound as claimed in any one of claims 1 to 19 wherein  $X_4$ , when present, is OR<sub>6</sub>.

21. A compound as claimed in claim 20 wherein  $R_6$  is hydrogen or optionally substituted acyl.

35. 22. A compound selected from the group consisting of:

*N*-benzyl-*S*-(2,3,5,6-tetra-*O*-benzoyl- $\beta$ -D-galactofuranosyl)sulfenamide

*N,N*-dibenzyl-*S*-(2,3,5,6-tetra-*O*-acetyl- $\beta$ -D-galactofuranosyl)sulfenamide

*N,N*-dicyclohexyl-*S*-(2,3,5,6-tetra-*O*-acetyl- $\beta$ -D-galactofuranosyl)sulfenamide

5      *N,N*-di(2-methoxyethoxyethyl)-*S*-(2,3,5,6-tetra-*O*-acetyl- $\beta$ -D-galactofuranosyl)sulfenamide

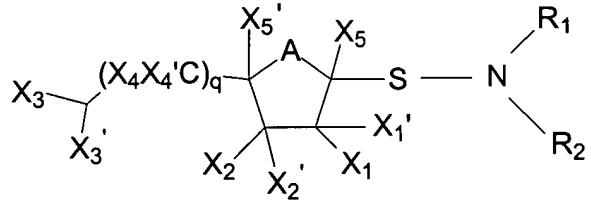
1-(2,2,6,6-tetramethylpiperidinyl)-*S*-(2,3,5,6-tetra-*O*-acetyl- $\beta$ -D-galactofuranosyl)sulfenamide

10     *N,N*-dioctyl-*S*-(2,3-di-*O*-acetyl-5-*O*-[tert-butylidiphenylsilyl]- $\alpha$ -D-arabinofuranosyl)sulfenamide

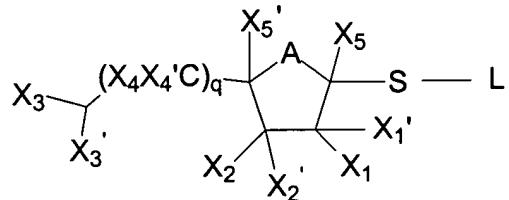
*N,N*-Dibenzyl-*S*-( $\beta$ -D-galactofuranosyl)sulfenamide

*N,N*-Di(2-methoxyethoxyethyl)-*S*-( $\beta$ -D-galactofuranosyl)sulfenamide

23. A method of preparation of a compound of general  
15 formula (I):

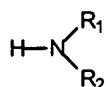


comprising reacting a compound of general formula  
20 (II):



wherein L is a leaving group, preferably acetyl  
25 and X<sub>1</sub>, X<sub>1'</sub>, X<sub>2</sub>, X<sub>2'</sub>, X<sub>3</sub>, X<sub>3'</sub>, X<sub>4</sub>, X<sub>4'</sub>, X<sub>5</sub> and X<sub>5'</sub>, are as  
defined;

with a compound of general formula (III):



wherein  $R_1$  and  $R_2$  are as defined above;  
in the presence of a bis-activated alkyl halide.

24. A method for the treatment of a microbial  
5 infection, comprising administering to a patient in need  
of such treatment a therapeutically effective amount of a  
compound of general formula (I) as claimed in any one of  
claims 1 to 22.

25. The use of a compound of general formula (I) as  
10 claimed in any one of claims 1 to 22 in the manufacture of  
a medicament for use in the treatment of a microbial  
infection.

26. A pharmaceutical composition comprising a  
compound of general formula (I) as claimed in any one of  
15 claims 1 to 22 and a pharmaceutically acceptable carrier.

27. A method of killing a microorganism, comprising  
exposing said microorganism to a compound of general  
formula (I) as claimed in any one of claims 1 to 22.